

**RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:**

**Bid Receiving - PWGSC / Réception des
soumissions - TPSGC**
11 Laurier St./ 11 rue, Laurier
Place du Portage, Phase III
Core 0B2 / Noyau 0B2
Gatineau, Québec K1A 0S5
Bid Fax: (819) 997-9776

**REQUEST FOR PROPOSAL
DEMANDE DE PROPOSITION**

**Proposal To: Public Works and Government
Services Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Proposition aux: Travaux Publics et Services
Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

Comments - Commentaires

Title - Sujet COMBUSTION GAS ANALYSIS SYSTEM	
Solicitation No. - N° de l'invitation W8486-152132/B	Date 2015-04-02
Client Reference No. - N° de référence du client W8486-152132	
GETS Reference No. - N° de référence de SEAG PW-\$\$PV-941-67095	
File No. - N° de dossier pv941.W8486-152132	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2015-04-29	Time Zone Fuseau horaire Eastern Daylight Saving Time EDT
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Martins, Christina	Buyer Id - Id de l'acheteur pv941
Telephone No. - N° de téléphone (819) 956-6911 ()	FAX No. - N° de FAX (819) 956-3814
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: Specified Herein Précisé dans les présentes	

Instructions: See Herein

Instructions: Voir aux présentes

Vendor/Firm Name and Address

**Raison sociale et adresse du
fournisseur/de l'entrepreneur**

Issuing Office - Bureau de distribution

Scientific, Medical and Photographic Division / Division
de l'équipement scientifique, des produits photographiques
et pharmaceutiques
11 Laurier St./ 11 rue, Laurier
6B1, Place du Portage
Gatineau, Québec K1A 0S5

Delivery Required - Livraison exigée See Herein	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

Destination Code - Code destinataire	Destination Address - Adresse de la destination	Invoice Code - Code bur.-comptable	Invoice Address - Adresse de facturation
D - 1	DND C/O QETE WAREHOUSE 819-997-1706 RAMP # 8, ROOM C-1113 45 SACRE-CŒUR BLVD GATINEAU QC J8X 1C6 CANADA	W8486	DEPARTMENT OF NATIONAL DEFENCE 101 COLONEL BY DR. Maria Lynn QETE 5-4 819-997-2181 OTTAWA Ontario K1A0K2 Canada

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Solicitation No. - N° de l'invitation

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Client Ref. No. - N° de réf. du client

W8486-152132

Amd. No. - N° de la modif.

File No. - N° du dossier

pv941W8486-152132

Buyer ID - Id de l'acheteur

pv941

CCC No./N° CCC - FMS No/ N° VME

Annex B REQUIREMENT

COMBUSTION GAS ANALYSIS SYSTEM

PART 1 - GENERAL INFORMATION

1.1 Requirement

The requirement is Detailed under the "Line Item Detail" and herein.

1.2 Debriefings

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days of receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

PART 2 - BIDDER INSTRUCTIONS

2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the Standard Acquisition Clauses and Conditions Manual (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The 2003(2014-09-25) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 5.4 of 2003, Standard Instructions - Goods or Services - Competitive Requirements, is amended as follows:

Delete: sixty (60) days
Insert: ninety (90) days

2.1.1 SACC Manual Clauses

B1000T	Condition of Material	2014-06-26
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2.2 Submission of Bids

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated on page 1 of the bid solicitation.

2.3 Enquiries - Bid Solicitation

All enquiries must be submitted in writing to the Contracting Authority no later than ten (10) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated, and the enquiry can be answered to all bidders. Enquiries not submitted in a form that can be distributed to all bidders may not be answered by Canada.

2.4 Applicable Laws

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario, Canada.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the bidders.

PART 3 - BID PREPARATION INSTRUCTIONS

3.1 Bid Preparation Instructions

Canada requests that bidders provide their bid in separately bound sections as follows:

Section I: Technical Bid (Three (3) hard copies)
Section II: Financial Bid (One (1) hard copy)
Section III: Certifications (One (1) hard copy)

If there is a discrepancy between the wording of the soft copy and the hard copy, the wording of the hard copy will have priority over the wording of the soft copy.

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that bidders follow the format instructions described below in the preparation of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

In April 2006, Canada issued a policy directing federal departments and agencies to take the necessary steps to incorporate environmental considerations into the procurement process

Policy on Green Procurement.

(<http://www.tpsgc-pwgsc.gc.ca/ecologisation-greening/achats-procurement/politique-policy-eng.html>). To assist Canada in reaching its objectives, bidders should:

- 1) use 8.5 x 11 inch (216 mm x 279 mm) paper containing fibre certified as originating from a sustainably-managed forest and containing minimum 30% recycled content; and
- 2) use an environmentally-preferable format including black and white printing instead of colour printing, printing double sided/duplex, using staples or clips instead of cerlox, duotangs or binders.

Section I: Technical Bid

In their technical bid, bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

3.1.1 Manuals

One (1) operating, maintenance and troubleshooting manual must be provided with the Combustion Gas Analysis System.

3.1.2 Installation/Commissioning (BIDDER TO COMPLETE)

On-site installation and commissioning must be provided and be carried out by a qualified service technician.

State your best installation schedule. Installation will be carried out within _____ calendar days of delivery and be completed within _____ calendar days.

3.1.3 Training (BIDDER TO COMPLETE)

On-site user training must be provided for up to five (5) users. All costs associated with the on-site training must be included in the price.

On-site training will be completed within _____ calendar days of installation.

Provide complete details of training e.g. duration, scope, etc.,

3.1.4 Service (BIDDER TO COMPLETE)

Purchase of the Combustion Gas Analysis System must include: technical support; technical phone support; support via the Internet; and support via a fax-back document system for a minimum of one (1) year.

Response for service must be within 24 hours or less.

Also, provide the following with your bid (for information purposes only):

- a) Location of available service facilities (after sales service and repair). List the service facilities closest to the destination.

- b) Locations of available replacement parts from consumable to major components.

- c) Response time re: service calls, and escalation schedule, i.e. (how many days with no resolution to a problem until a more experienced person is called in, and from which location).

- d) List the frequency of routine maintenance visits provided by a qualified service technician during the warranty period, if applicable and included in the price.

3.1.5 Software Updates

The Bidder must provide all software updates and new releases to the purchaser for a period of two (2) years following the acceptance, at no additional cost.

Note: The word "updates" means all enhancements, extensions or other modifications to the software. The word "releases" means enhancements or modifications to the software or new modules or supplementary modules that function in conjunction with the software, that represent the next generation of software, and which the Contractor has decided to make available to its customers usually for an additional charge.

3.1.6 Product(s) Offered (BIDDER TO COMPLETE)

The Bidder must indicate the make and model number of the products offered (identify specific components which make up the system):

Name of Manufacturer: _____

Model/Part Number: _____

Literature attached: Yes (____) No (____)

3.1.7 Point of Manufacture/Shipping (BIDDER TO COMPLETE)

The Bidder must state the point of manufacture/shipping of goods or where service is to be performed:

Location: _____

Postal Code: _____

3.1.8 Contacts

Bidders are requested to provide the following: Information pertaining to Article 5.4 Contractor Representatives under Part 6, Resulting Contract Clauses.

Section II: Financial Bid

The Bidder must quote a firm lot price all inclusive of supply, installation, commissioning, training, software updates and manuals, DDP (Gatineau, Quebec) Incoterms 2000, for the goods identified in Line Item 2, the Goods and Services Tax (GST) and/or the Harmonized Sales Tax (HST) extra, as applicable. Freight charges to destination and all applicable Customs duties and Excise taxes must be included.

3.2 Exchange Rate Fluctuation

C3011T

Exchange Rate Fluctuation

2013-11-06

Section III: Certifications

Bidders must submit the certifications required under Part 5.

PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION**4.1 Evaluation Procedures**

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

4.1 Technical Evaluation

All proposals submitted must be completed in full and provide all of the information requested in the Request for Proposal (RFP) package to enable a full and complete evaluation. If the requirement is not addressed in the bidder's proposal, the proposal will be considered incomplete or non-responsive and will be rejected. The onus is on the bidder to provide all the information necessary to ensure a complete and accurate assessment.

Factors for Evaluation

1. **PRICING BASIS (MANDATORY):** Prices must be firm, DDP Delivered Duty Paid.

2. **ABILITY TO MEET THE TECHNICAL REQUIREMENT (MANDATORY):**

a) For Items Defined by Specifications:

supporting
to their

The bidder is required to cross reference with the exact location in the documentation the mandatory technical criteria contained herein supporting technical documentation.

b) Provision of Supporting Technical Documentation:

Supporting technical documentation for the stores offered shall be provided with the bid at time of bid closing.

Technical brochures or technical data MUST be provided to verify compliancy to the technical mandatory specifications.

Included: Yes : _____

3. **COMPLIANCE WITH THE TERMS AND CONDITIONS OF THIS REQUEST FOR PROPOSAL (MANDATORY)**

4. **FOR CANADIAN SUPPLIERS ONLY:** Please note that the requirements of the Federal Contractors Program for Employment Equity may apply - see herein. (MANDATORY if applicable)

4.1.2 Financial Evaluation

The lowest evaluated price will be established using the following criteria:

a) Prices will be evaluated in Canadian Funds including any applicable Taxes and Canadian Customs Duty (if applicable) and excluding the Goods and Services Tax (GST) or Harmonized Sales Tax (HST). For evaluation purposes, bids received in a foreign currency will be converted to Canadian funds using the appropriate rate of exchange using the rate quoted by the Bank of Canada as being in effect on date of bid closing.

b) Prices will be evaluated on a DDP (Gatineau, Quebec)

4.2 Basis of Selection

A0069T Basis of Selection

2007-05-25

PART 5 - CERTIFICATIONS

Bidders must provide the required certifications and associated information to be awarded a contract.

The certifications provided by bidders to Canada are subject to verification by Canada at all times. Canada will declare a bid non-responsive, or will declare a contractor in default in carrying out any of its obligations under the Contract, if any certification made by the Bidder is found to be untrue whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority may render the bid non-responsive or constitute a default under the Contract.

5.1 Certifications Precedent to Contract Award and Certifications Required with the Bid

5.1.1 Certifications Precedent to Contract Award

5.1.1.1 Integrity Provisions - Associated Information

By submitting a bid, the Bidder certifies that the Bidder and its Affiliates are in compliance with the provisions as stated in Section 01 Integrity Provisions - Bid of Standard Instructions 2003. The associated information required within the Integrity Provisions will assist Canada in confirming that the certifications are true.

5.1.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "[FCP Limited Eligibility to Bid](http://www.labour.gc.ca/eng/standards_equality/eq/emp/fcp/list/inelig.shtml)" list (http://www.labour.gc.ca/eng/standards_equality/eq/emp/fcp/list/inelig.shtml) available from [Employment and Social Development Canada \(ESDC\) - Labours website](http://www.labour.gc.ca/eng/standards_equality/eq/emp/fcp/list/inelig.shtml).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "[FCP Limited Eligibility to Bid](http://www.labour.gc.ca/eng/standards_equality/eq/emp/fcp/list/inelig.shtml)" list at the time of contract award.

PART 6 - RESULTING CONTRACT CLAUSES

6.1 Security Requirement

There is no security requirement applicable to this Contract.

6.2 Requirement

The Contractor must provide the items detailed under the Line Item Detail.

6.2.1 Manuals

One (1) operating, maintenance and troubleshooting manual must be provided with the Combustion Gas Analysis System.

6.2.2 Installation/Commissioning

On-site installation and commissioning must be provided and be carried out by a qualified service technician.

6.2.3 Training

On-site user training must be provided for up to five (5) users.

6.2.4 Service

Purchase of the Combustion Gas Analysis System must include: technical support; technical phone support; support via the Internet; and support via a fax-back document system for a minimum of three (3) years.

6.2.5 Software Updates

The Bidder must provide all software updates and new releases to the purchaser for a period of two (2) years following the acceptance, at no additional cost.

6.3 Standard Clauses and Conditions

All clauses and conditions identified in the Contract by number, date and title are set out in the Standard Acquisition Clauses and Conditions Manual (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

6.3.1 General Conditions

2010A (2014-11-27), General Conditions - Goods (Medium Complexity), apply to and form part of the Contract.

6.3.2 Supplemental General Conditions

4003(2010-08-16) Supplemental General Conditions - Licensed Software, apply to and form part of the Contract.

4004(2013-04-25) Supplemental General Conditions - Maintenance and Support Services for Licensed Software, apply to and form part of the Contract.

6.4 Term of Contract

6.4.1 Delivery Date

All deliverables are requested on or before August 28, 2015.

6.5 Authorities

6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Christina Martins
Supply Specialist
Public Works and Government Services Canada
Acquisitions Branch
Commercial and Consumer Products Directorate
Place du Portage III, 6A2
11 Laurier St. Gatineau, Quebec
K1A 0S5
Telephone: (819) 956-6911
Facsimile: (819) 956-3814
Christina.Martins@tpsgc-pwgsc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

6.5.2 Technical Authority (TO BE COMPLETED AT TIME OF CONTRACT AWARD)

The Technical Authority for the Contract is:

Name: _____

Title: _____

Organization: _____

Address: _____

Telephone : _____

Facsimile: _____

E-mail address: _____

The Technical Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Technical Authority, however the Technical Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

6.5.3 Procurement Authority (TO BE COMPLETED AT TIME OF CONTRACT AWARD)

The Procurement Authority for the Contract is:

Name: _____

Title: _____

Organization: _____

Address: _____

Telephone : ____ _

Facsimile: ____ _

E-mail address: _____

The Procurement Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Procurement Authority, however the Procurement Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

6.5.4 Contractor's Representative (PLEASE FILL IN)

General Enquiries

Name: _____

Telephone No. _____

Facsimile No. _____

E-mail address: _____

Delivery Follow-up

Name: _____

Telephone No. _____

Facsimile No. _____

E-mail address: _____

6.6 Payment

6.6.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm lot price as specified in the contract for Line Item 2, DDP Delivered Duty Paid (Gatineau, Quebec) Incoterms 2000. Customs duties are included and Applicable Taxes extra, if applicable.

6.6.1.1 Limitation of Price

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

6.6.2 SACC Manual Clauses

H1000C

Single Payment

2008-05-12

6.7 Invoicing Instructions

- a) The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is Completed.

FOR PROMPT PAYMENTS, ENSURE THE CONTRACT NO./P.O. NUMBER APPEARS ON ALL DOCUMENTATION.

- b) Invoices must be distributed as follows:

- (a) The original and one (1) copy must be forwarded to the address shown on page 1 of the Contract for certification and payment. The Contract serial number: W8486-152132 must appear on all invoices.
- (b) One (1) copy must be forwarded to the Contracting Authority identified under the section entitled "Authorities" of the Contract.

6.8 Certifications

6.8.1 Compliance

The continuous compliance with the certifications provided by the Contractor in its bid and the ongoing co-operation in providing associated information are conditions of the Contract. Certifications are subject to verification by Canada during the entire period of the Contract. If the Contractor does not comply with any certification, fails to provide the associated information, or if it is determined that any certification made by the Contractor in its bid is untrue, whether made knowingly or unknowingly, Canada has the right, pursuant to the default provision of the Contract, to terminate the Contract for default.

6.9 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario, Canada.

6.10 Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement;
- (b) 2010A (2014-11-27) General Conditions - Goods (Medium Complexity);
- (c) 4003(2010-08-16) Supplemental General Conditions - Licensed Software, apply to and form part of the Contract.
- (d) 4004(2013-04-25) Supplemental General Conditions - Maintenance and Support Services for Licensed Software, apply to and form part of the Contract.
- (e) Annex A, Statement of Work: Fourier Transform Infrared Combustion Gas Analysis System - Cone Calorimeter Attachment - MCE 293 Quality Engineering Test Establishment Flammability Laboratory of The Applied Science Section;
- (f) Annex B, Requirement; and
- (g) the Contractor's bid dated _____. **(insert date of bid)**

6.11 Defence Contract

SACC Manual clause A9006C(2012-07-16) Defence Contract

6.12 SACC Manual Clauses

B1501C	Electrical Equipment	2006-06-16
A9062C	Canadian Forces Site Regulations	2010-01-11
A2000C	Foreign Nationals (Canadian Contractor)	2006-06-16
OR		
A2001C	Foreign Nationals (Foreign Contractor)	2006-06-16
D9002C	Incomplete Assemblies	2007-11-30
D5545C	ISO 9001:2000 - Quality Management Systems - Requirements (QAC C)	2010-08-16
D5328C	Inspection/Acceptance	

6.13 Shipping Instructions - Delivery at Destination

1. Goods must be consigned to the destination specified in the Contract and delivered:

Delivered Duty Paid (DDP) (Gatineau, Quebec) Incoterms 2000 for shipments from a commercial contractor.
2. The Contractor will be responsible for all delivery charges, administration, costs and risk of transport and customs clearance, including the payment of customs duties and taxes.

6.14 Packaging Requirement using Specification D-LM-008-036/SF-000

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The Contractor must prepare item number two (2) for delivery in accordance with the latest issue of the Canadian Forces Packaging Specification D-LM-008-036/SF-000, DND Minimum Requirements for Manufacturer's Standard Pack.

The Contractor must package item number two (2) in quantities of one (1) per unit pack.

ANNEX A
STATEMENT OF WORK:
FOURIER TRANSFORM INFRARED COMBUSTION GAS ANALYSIS SYSTEM -CONE
CALORIMETER ATTACHMENT – MCE 293
QUALITY ENGINEERING TEST ESTABLISHMENT FLAMMABILITY LABORATORY OF THE
APPLIED SCIENCE SECTION

1.0 SCOPE

1.1 **Purpose.** This Statement of Work (SOW) defines the mandatory requirements and specifications for a Fourier Transform Infrared (FTIR) Combustion Gas Analysis System which is to be delivered to the Applied Science Section at the Quality Engineering Test Establishment (QETE).

1.2 **Background.** The FTIR Combustion Gas Analysis System is required to carry out quantitative toxic gas analyses of combustion products. The testing will be conducted in real time when coupled to a cone calorimeter, smoke density chamber and tube furnace. The concentrations of combustion gases including HCl, HBr, HCN, HF, NO, NO₂, SO₂, CO, CO₂ and acrolein will be monitored while samples are exposed to radiant heat with and without an ignition source. This instrument has been deemed essential for QETE to fulfill its mandate to the Canadian Armed Forces.

QETE has deemed that it is imperative to have the capability to define the toxicity of smoke produced from Military materiel in a potential fire, especially when the materiel is installed in confined areas or in contact with Military personnel. On many occasions our clients have required toxicity testing of in-service and candidate materiel.

1.3 **Terminology.** The terms used in this Statement of Work are as follows:

SOW	Statement of Work
FTIR	Fourier Transform Infrared
QETE	Quality Engineering Test Establishment
ISO	International Standards Organization
MCT	Mercury Cadmium Telleride
CSA	Canadian Standards Association

2.0 APPLICABLE DOCUMENTS

2.1 The Contractor must provide QETE with the operating, maintenance and troubleshooting manuals and media for the complete system as well as spare parts list in electronic format as a minimum. All materials must be in English.

3.0 REQUIREMENT

3.1 **Tasks.** The contractor must deliver, install and commission the FTIR Combustion Gas Analysis System in Room B 2010J in the National Printing Bureau.

3.2 Technical Requirement.

3.2.1 Described in Annex B of this SOW.

3.2.2 All electrical components must be Canadian Standard Association (CSA) approved.

3.3 **Constraints.** The following constraints apply to this project:

3.3.1 All work must be performed during normal business hours;

3.3.2 The Contractor must be authorized to perform work in the Province of Quebec;

3.3.3 The Contractor must have the appropriate liability insurance;

3.3.4 The Contractor performing the installation must be authorized by the Original Equipment Manufacture to work on the FTIR Combustion Gas Analysis System;

3.3.5 The Contractor must be responsible for securing and safe guarding tools and material used on the job-site; and

4.0 DELIVERABLES

4.1 The Contractor must be responsible for delivering the following goods and services:

- A Combustion Gas Analysis System that must be in compliance with the International Standard Organization (ISO) 19702 standard and must be able to characterize fire effluent by extractive multivariate analysis in which a fraction of the effluent is continuously flowed to a sample gas cell for remote measurement.
- The system must detect and quantify combustion gases such as HCl, HBr, HCN, HF, NO, NO₂, SO₂, CO, CO₂ as well as small organic molecules such as acrolein when coupled to either a cone calorimeter, smoke density chamber or tube furnace in which samples are exposed to radiant heat with and without an ignition source.
- FTIR System must withstand highly corrosive environments of combustion gases at operating temperatures up to 190°C. The FTIR system must be corrosion resistant, containing a zinc selenide interferometer and zinc selenide optics or equivalents. FTIR wavelength range must include all wavelengths between 650 cm⁻¹ and 4200 cm⁻¹. The Infrared source must be silicon carbide. The detector shall be a liquid nitrogen cooled mercury cadmium telluride (MCT) detector or Peltier cooled MCT detector of similar sensitivity. The Combustion Gas Analysis system must have its own controller, complete with all the required hardware (keyboard, interface cards, cables, screen, printer & related).
- The Contractor must install and conduct specification testing of all system components, accessories and software listed above. This must be completed within 30 days of delivery.
- QETE reserves the right to conduct a performance test on the system once the Contractor has completed the commissioning procedure.
- Refer to Annex B for complete details

**ANNEX B
REQUIREMENT
COMBUSTION GAS ANALYSIS SYSTEM**

The COMBUSTION GAS ANALYSIS SYSTEM **must** meet all of the following requirements:

- 1. The system must be able to characterize fire effluent by extractive multivariate analyses in which a fraction of the effluent is continuously flowed to a sample cell for remote measurement.

Reference in Contractors Proposal: _____

- 2. The system must be able to withstand highly corrosive environments of combustion gases at operating temperatures up to 190°C.

Reference in Contractors Proposal: _____

- 3. The IR source must be silicon carbide or equivalent.

Reference in Contractors Proposal: _____

- 4. The system enclosure must be hermetically sealed.

Reference in Contractors Proposal: _____

- 5. The spectral resolution must be able to reach less than or equal to 1 cm⁻¹.

Reference in Contractors Proposal: _____

- 6. The system must be corrosion resistant, containing a zinc selenide interferometer and zinc selenide optics or corrosion resistant equivalents.

Reference in Contractors Proposal: _____

- 7. The system wavelength range must include all wavelengths between 650 cm⁻¹ and 4500 cm⁻¹.

Reference in Contractors Proposal: _____

- 8. The detector must be a liquid nitrogen cooled mercury cadmium telluride (MCT) detector or Peltier cooled MCT detector of similar sensitivity.

Reference in Contractors Proposal: _____

- 9. The system must be capable of a measurement interval less than or equal to 5 seconds in order to deal with changing gas concentrations during the course of testing.

Reference in Contractors Proposal: _____

- 10. The system must be able to be operated with a scan time less than or equal to 1 second.

Reference in Contractors Proposal: _____

11. A minimum of five (5) scans must be collected during the measurement interval.

Reference in Contractors Proposal: _____

12. The Gas Cell must be able to withstand damage from highly corrosive gases up to 190°C including hydrogen chloride, hydrogen bromide, hydrogen fluoride, hydrogen sulphide, nitrogen oxides, sulphur dioxide and acrolein.

Reference in Contractors Proposal: _____

13. The gas cell must contain mirrors coated with gold or an equivalent corrosion resistant coating.

Reference in Contractors Proposal: _____

14. The windows must be a metallized coated zinc selenide or an equivalent corrosion resistant material.

Reference in Contractors Proposal: _____

15. The gas cell body must be corrosion resistant.

Reference in Contractors Proposal: _____

16. The o-ring seals must be able to withstand damage from corrosive gases.

Reference in Contractors Proposal: _____

17. The gas cell must include a heated insulation jacket or equivalent that maintains cell temperature evenly up to 190°C.

Reference in Contractors Proposal: _____

18. The gas cell must have user replaceable windows.

Reference in Contractors Proposal: _____

19. The Gas Cell must have a path-length and volume that will allow the FTIR system in combination with the FTIR interferometer resolution Full Width at Half Maximum (FWHM) that will achieve the following Minimum Detectable Limits (MDL) with S/N =3 at atmospheric conditions in the presence of water (12,000 ppm): CO (2 ppm), CO₂ (2 ppm), HBr (2 ppm), HCl (2 ppm), NO (2 ppm), NO₂ (2 ppm), SO₂ (2 ppm), acrolein (2 ppm).

Reference in Contractors Proposal: _____

20. The gas cell volume must be less than or equal to 300 mL.

Reference in Contractors Proposal: _____

21. The path-length must be between 4 metres and 8 metres.

Reference in Contractors Proposal: _____

22. The gases HCl, HCN, HBr, NO, NO₂, SO₂, CO, CO₂, H₂O and acrolein must be factory calibrated for the specific combustion gas analysis system at the manufacturer's site at elevated temperatures of either 170 or 180 °C under atmospheric conditions with at least 5 concentrations evenly distributed over the following concentration ranges: HCl (10 ppm to 10,000 ppm); HCN (10 ppm to 1000 ppm); HBr (10 ppm to 1000 ppm), NO (10 ppm to 1000 ppm); NO₂ (10 ppm to 1000 ppm); SO₂ (10 ppm to 2500 ppm); CO (5 ppm to 5000 ppm); CO₂ (50 ppm to 10% volume), acrolein (50 ppm to 300 ppm), water (1000 ppm to 20% volume).

Reference in Contractors Proposal: _____

SYSTEM FRAMEWORK COMPONENTS:

23. Corrosion Resistant Sample Gas Pump with Polytetrafluoroethylene (PTFE) head must operate at temperatures of at least 100 °C.

Reference in Contractors Proposal: _____

24. The pump must be able to operate in pulling mode.

Reference in Contractors Proposal: _____

25. The pump must be capable of handling corrosion gases that have condensed liquids.

Reference in Contractors Proposal: _____

26. Flow rates between 0 – 15 L/min must be attainable.

Reference in Contractors Proposal: _____

27. Heated insulated sample transfer line must come with a replaceable ¼" outside diameter (OD) Teflon PFA (perfluoroalkoxy) (inside diameter (ID) > 0.1") liner or material of equivalent corrosion resistance that withstands operating temperatures up to 190 °C.

Reference in Contractors Proposal: _____

28. The transfer line length must be 3 metres to accommodate attachment to instrumentation.

Reference in Contractors Proposal: _____

29. Temperature compensated pressure transducer must sense pressures between 0 – 30 si in the gas cell and send real-time signal through the interface to software for auto-correction.

Reference in Contractors Proposal: _____

30. Heated filter with 3-way valve (to be placed between the probe and transfer line) must have a ceramic filter with 2 micron porosity and be able to withstand operating temperatures up to 190 °C. A ¼" compression fitting is required for attachment to the probe.

Reference in Contractors Proposal: _____

31. The system must contain a corrosion resistant flow meter (1 – 20 liter per minute) and water trap.

Reference in Contractors Proposal: _____

CONTROLLER AND OPERATING SOFTWARE:

32. The system must come with its own controller, complete with all the required hardware (keyboard, interface cards, cables, screen, printer & related).

Reference in Contractors Proposal: _____

33. The controller must be able to monitor and correct for changes in pressure, temperature and flow rate during an analysis.

Reference in Contractors Proposal: _____

34. Temperature Controller must control temperature up to at least 190°C for 2 heated areas.

Reference in Contractors Proposal: _____

35. The instrument controller must allow the full control of the settings & the operation of the system, the acquisition, storage / retrieval and treatment of experimental data.

Reference in Contractors Proposal: _____

36. The computer system must be windows based and have a processor, memory, hard disk drive, mouse and monitor that will fully support all the software.

Reference in Contractors Proposal: _____

37. The controller must have at least an Intel Core i7 processor, at least 8 GB DDR3, at least 1TB HDD and at least 21" monitor that is not less than 21 inches.

Reference in Contractors Proposal: _____

38. Quantitative spectral analysis software must use advanced multivariate algorithms to analyse linear and nonlinear multi-components.

Reference in Contractors Proposal: _____

39. Concentration data must be automatically corrected for temperature and pressure changes.

Reference in Contractors Proposal: _____

40. The software must be able to conduct spectral searches against the sample spectra.

Reference in Contractors Proposal: _____

41. Quantitative spectral analyses software must be completely compatible with data manipulation software and standards library.

Reference in Contractors Proposal: _____

42. The files must be exportable to Microsoft Office software or at least exportable in CSV format.

Reference in Contractors Proposal: _____

43. Gas Phase Infrared spectral standards library must contain multiple spectra in the ranges recommended by ISO 19702 of at least 150 gases including combustion gases HCl, HF, HCN, HBr, NO, NO₂, SO₂, CO, CO₂, and acrolein which have been run at the same elevated temperature as the factory calibrated spectra, with at least 5 evenly distributed concentrations.

Reference in Contractors Proposal: _____

44. The calibration spectra must be stored and available for spectral searches.

Reference in Contractors Proposal: _____

45. The standards library must be completely compatible with the quantitative spectral analysis software and the data manipulation software.

Reference in Contractors Proposal: _____

46. Data manipulation software must be able to conduct graphical interface functions such as baseline correct, spectral subtract, perform derivatives, smooth, offset, truncate, scale, peak pick and convert between absorbance and transmittance.

Reference in Contractors Proposal: _____

47. The data manipulation software must be completely compatible with the quantitative spectral analysis software and standards library.

Reference in Contractors Proposal: _____

48. The operating software must allow future method development & storage by the operators.

Reference in Contractors Proposal: _____

49. All proprietary software must be of the most current version and must be capable of being installed, running and being updated offline.

Reference in Contractors Proposal: _____

50. All proprietary software must be provided with a full end-user licence not limited in time and backup CD/DVD disk(s).

Reference in Contractors Proposal: _____

51. Electrical Power Requirement and Plug must be compatible with a North American power outlets of 115 V, 15 A.

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Reference in Contractors Proposal: _____